



# Agroforestry and biodiversity

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# Agroforestry in Germany

- Legally defined within subsidy law since 2023
- Combining cultivation of agricultural goods (crops/livestock) with **cultivation of trees and shrubs**
- Different **requirements** (share of trees and shrubs of total agricultural area, certain trees are banned) **for basic subsidy**
- More **requirements for further subsidies** (eco scheme, subsidy for **establishing** an Agroforestry system)

See [“Themenblatt 3: AFS in der GAP 2023”](#)



# DeFAF– German Federation for Agroforestry



## Goal: Promotion of Agroforestry in Germany

- Non-profit organization founded in 2019
- Education, (first)consultancy of farmers and other stakeholders
- Networking: Farmers, scientists, policy makers
- Lobbying: communicating expertise on Agroforestry

## Working structure

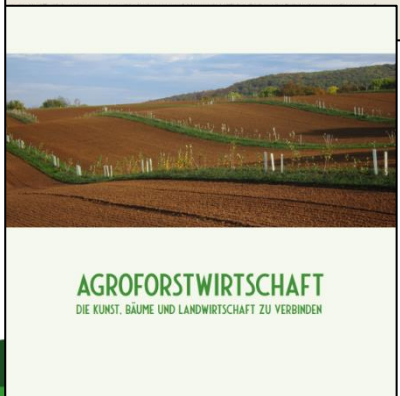
- 8 thematic departments – voluntary basis
- Main office in Cottbus with currently 6 employees
- Regional groups are forming





# Activities and offers of DeFAF

- Information materials
- Digital and print
- Support and initiation of (research) projects
- Organization of events
- “Forum Agroforstsysteme” (next 2025 in Gießen)
- Education
- Agroforestry-Academy



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# Current projects of DeFAF e.V.



Transfer of knowledge



Value creation



# General situation of Agroforestry in Germany

Figures of the actual amount and size of Agroforestry systems (AFS) are not available!

- AFS can be officially registered as such since 2023, however there are obstacles to do so
- There are no reliable figures

Attempt to monitor AFS through [agroforestry map](#) by DeFAF

- Agroforestry farms as well as institutions and interested entities can **enter their data themselves**
- **Entries are promoted, however only a share of AFS are included!**



Figure 1: agroforestry map of Germany

# Data based on DeFAF Agroforestry map

- **Total AFS: 154**
- **Total area of AFS: 1164 hectares**
- **Total area of shrubs and trees in AFS: 236 hectares**
- **Average tree cover in AFS: 20%**

(November 2023)

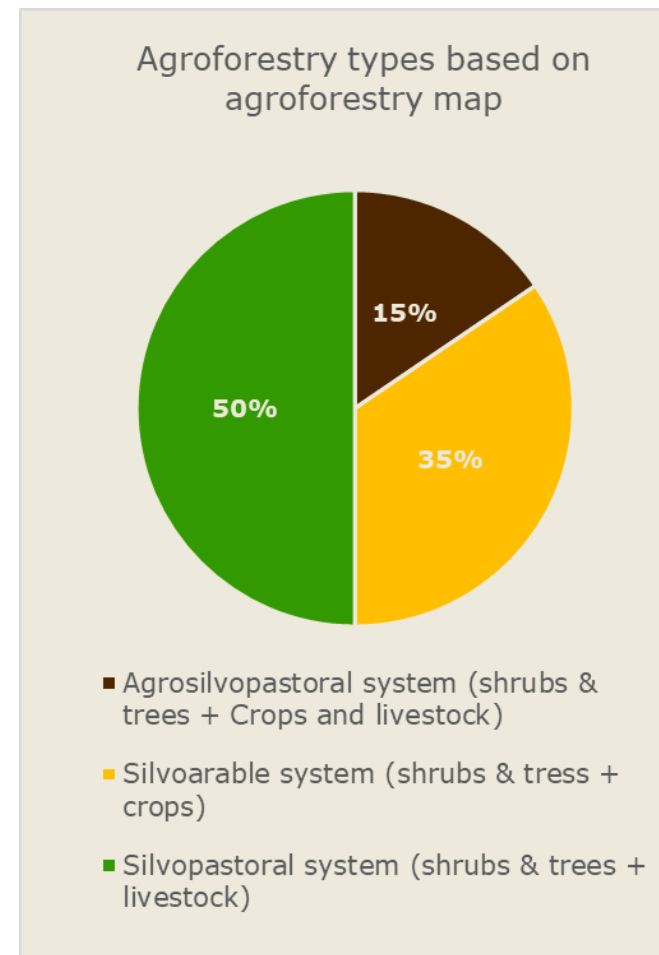
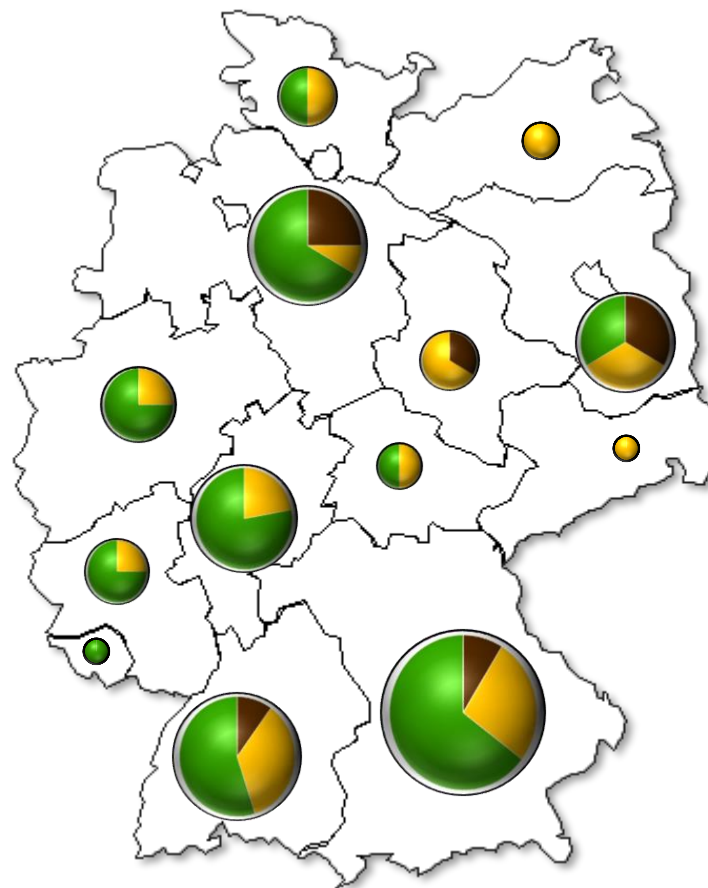


Figure 2: share of agroforestry types



# Distribution of Agroforestry within Germany



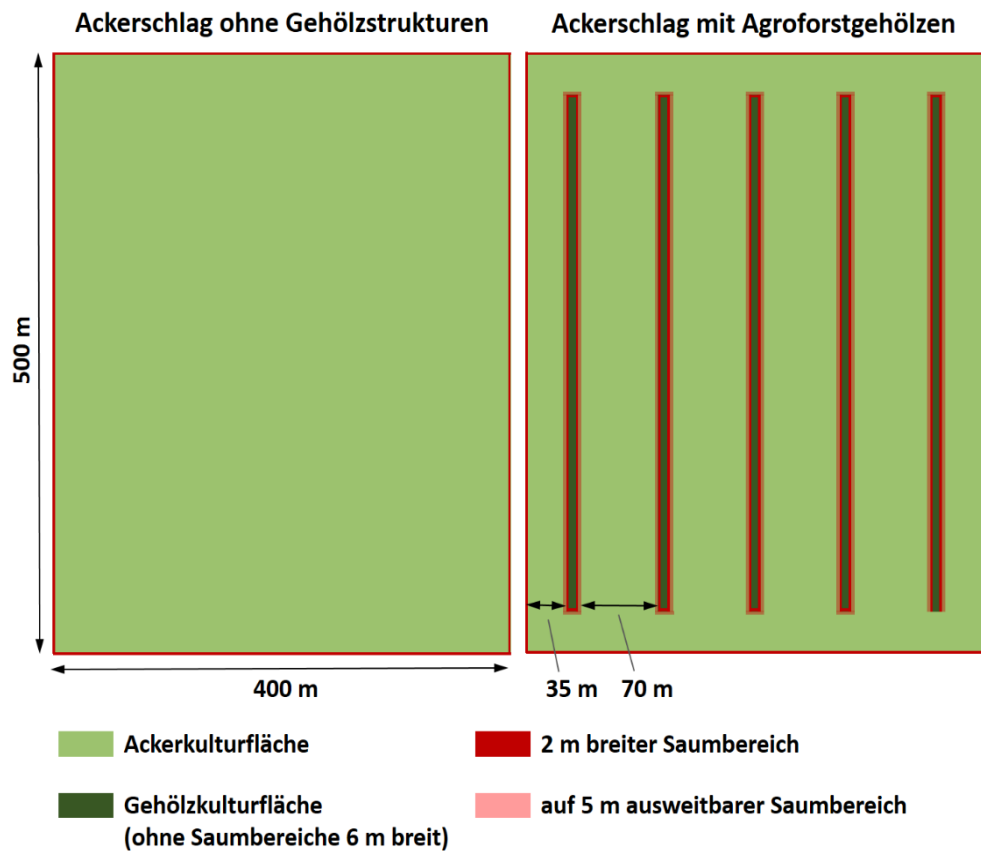
*Figure 3: Distribution of AFS in different states of Germany. Size of respective figure shows relative amount of AFS*

# Effects of Agroforestry on (agro)biodiversity

**Shaping diversely  
structured landscapes**



# Creating habitat for resting and development



Quelle: anlehnend an Böhm (2020): Multifunktionale Landnutzung – mit Agroforstwirtschaft zu einer struktureicheren Agrarlandschaft. Naturmagazin 1/2020, 20-21



# Creating habitat for resting and development

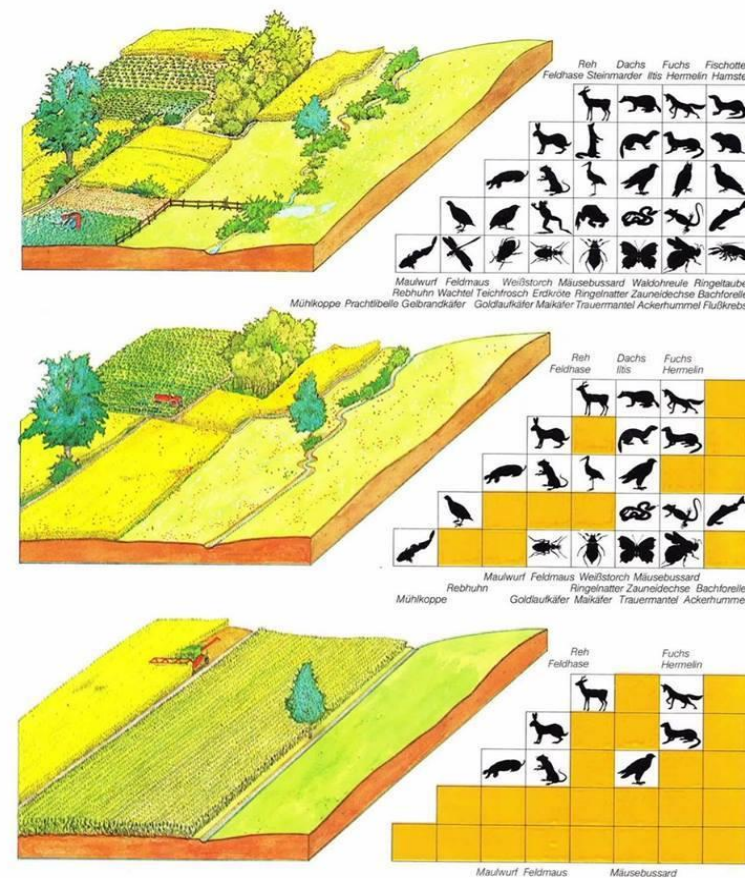
- Positive effect on animal biodiversity in tree rows due to **less disturbance**
  - More Birds, but less ground beetles (Schulz et al., 2009)
  - Research so far implemented in short rotation coppices (SRC): Monoculture plantation of fast growing trees
- Woody stripes provide **temporary habitat** and can **connect different habitats** (Zitzmann et al., 2022, Ehrhrit 2020)
- Function as **buffer zones** between agricultural fields and sensitive nature conservation areas (Strohm, 2012)



# Effects of Agroforestry on (agro)biodiversity

Diversely structured landscapes promote agrobiodiversity!

- **Local biodiversity is influenced** by available pool of species population in the **surrounding landscape** (Tscharrntke et al., 2020)
- Improved **landscape complexity** promotes **insect diversity** (Marja et al., 2022)
- Trees and shrubs form this structure
- In Agroforestry systems, these structural elements can be used in agriculture und hence promote biodiversity (Hildmann et al., 2022)
- **Farmers are motivated** to integrate such structures within the land they are cultivating



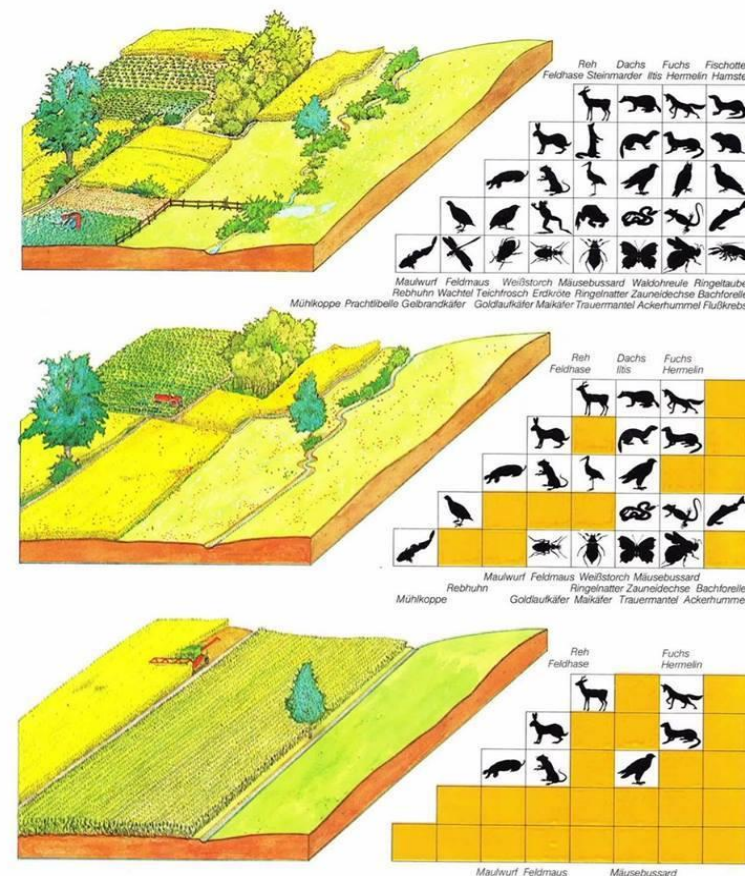
Source:

<https://www.pulsdererde.org/wp-content/uploads/2019/02/19-09-Agrarlandschaft-mit-Artenvielfalt.jpg>



# Effects of Agroforestry on (agro)biodiversity

- Woody structures promote **bat activity** (Krings et al., 2022)
- Woody crops require **less pesticide application**
  - Reduced application of pesticides on agricultural land (Böhm & Kanzler, 2020)
- Effects differ in the respective agroforestry system!
  - **Permanence:** Short rotation system or long term production of value timber and/or fruits & nuts?
- Maximising of **ecotones** (transition area between different habitats) by integrating **fallow stripes** along the tree rows
- **Species-diversity** of woody crops (providing food for e.g. wild bees and other insects)



Source:

<https://www.pulsdererde.org/wp-content/uploads/2019/02/19-09-Agrarlandschaft-mit-Artenvielfalt.jpg>



# Effects of Agroforestry on Soil organisms

“Tree rows **promoted the abundance of bacteria and earthworms**”

- Mainly due to tree litter input and absence of tillage
- Increased proportion of ectomycorrhizal fungi

(Vaupel et al., 2023)

Agroforestry systems alter the microbial community

- More microorganisms that digest woody biomass (Beule & Karlovsky, 2021)

**More about the effect of Agroforestry on soil from Dr. Lukas Beule, January 9<sup>th</sup>!**



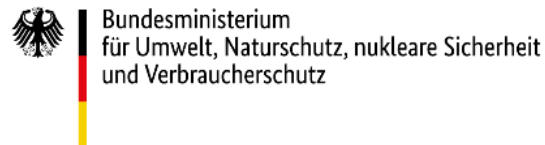
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# SEBAS: Förderung der biologischen Vielfalt durch Agroforstwirtschaft (Promotion of biodiversity through Agroforestry)

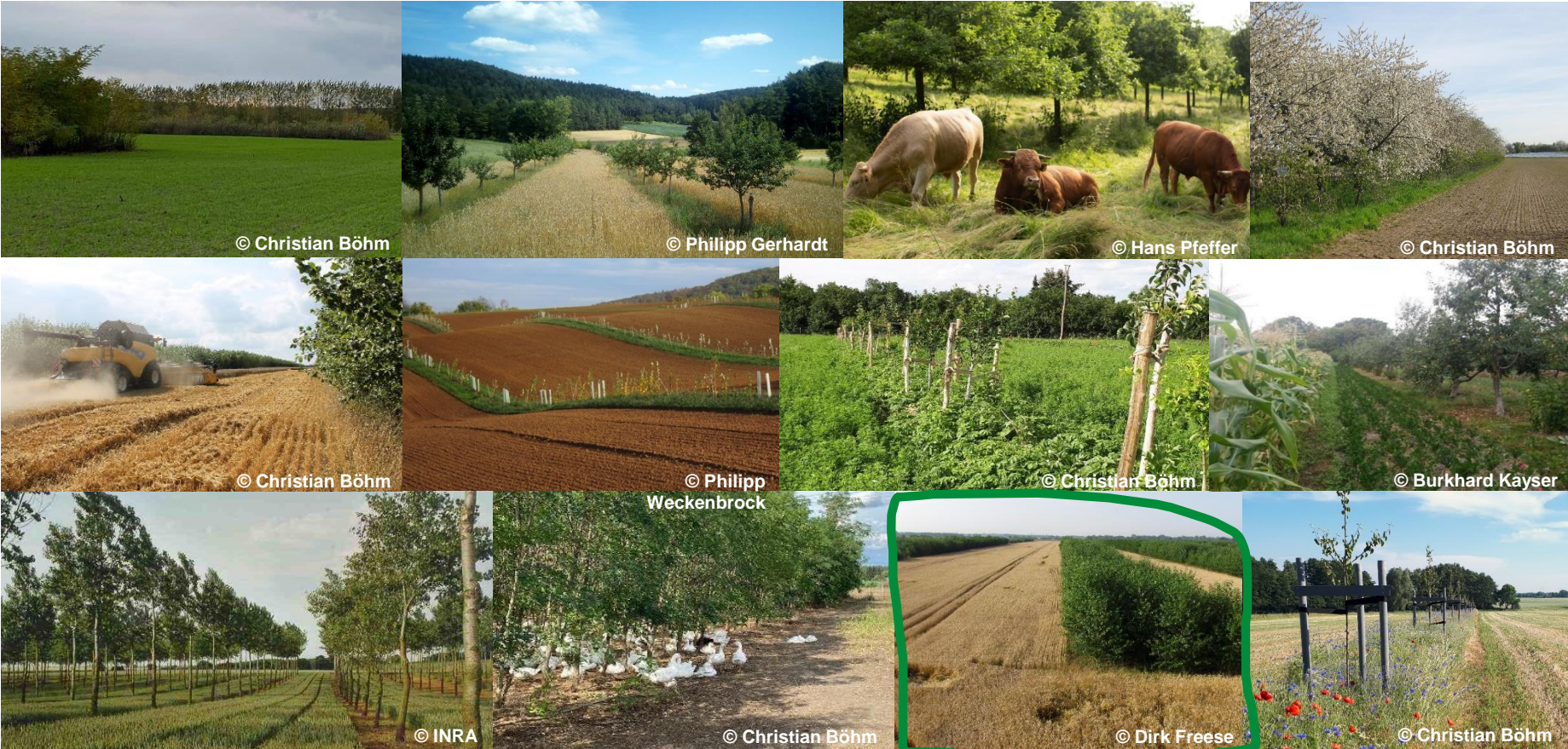
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# Main Research Question

Do Agroforestry systems promote **biodiversity of insects**?

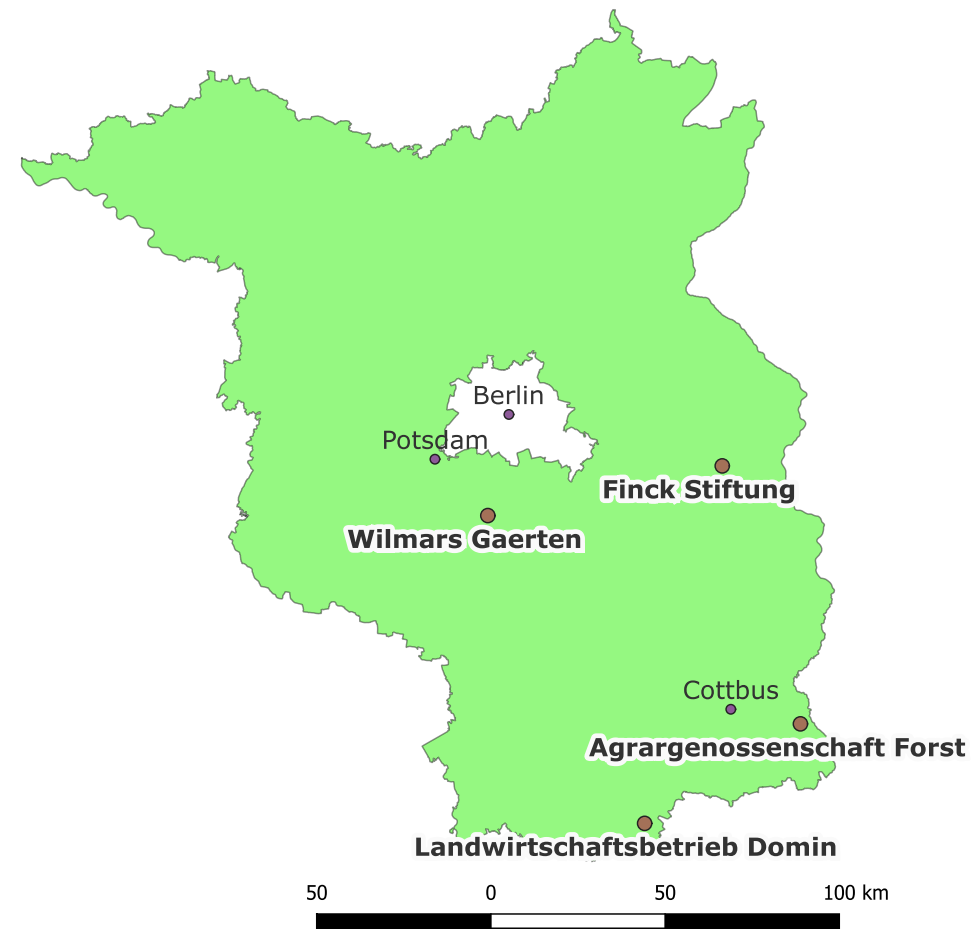




# Research design

## Research plots on 4 Agroforestry farms in Brandenburg

- Already established silvoarable Agroforestry systems
- Short-Rotation alley cropping systems for wood chip production
- Tree species: different poplar hybrids (*populus* spp.)



# Research design

## 3 Habitats

- Tree row
  - Fallow stripe
  - Cropland
- Reference: Cropland without Agroforestry system





# Research Questions

- How do Agroforestry systems influence the **amount, abundance** and **spatial distribution** of **insects**?
- How does the influence change in **simulated drier conditions**?





# Research Question & Goals

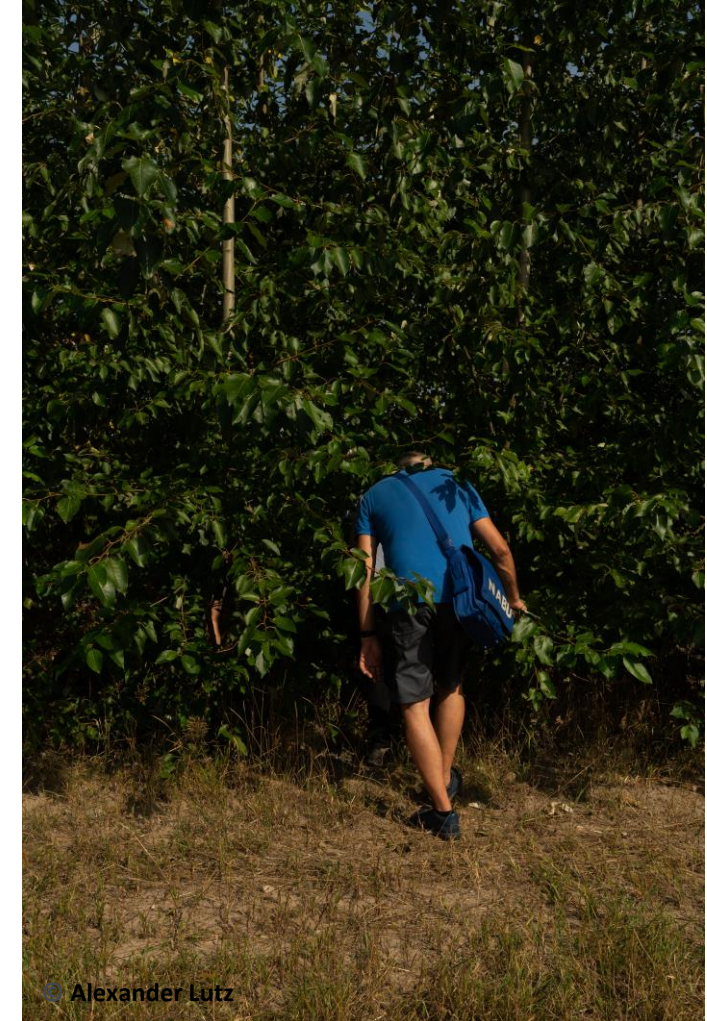
- How do Agroforestry systems influence different **ecosystem services**?
  - Pest control
  - Nutrient release
  - Pollination service
- **Transfer** of gained **knowledge** to different stakeholders
  - Farmers & Landowners
  - Policy makers
  - Public
- **Promoting** the **establishment** of **Agroforestry systems**



# Goals: Nature conservation

- Identifying **objectives of conflicts** between **Agroforestry** and **nature conservation**
- **Building bridges** between **Agroforestry** as an **agricultural production systems** and **nature conservation goals**
- Example: Agroforestry systems in **nature conservation areas** (e.g. NATURA 2000 bird conservation areas)

[More on www.agroforst-info.de/sebas](http://www.agroforst-info.de/sebas)



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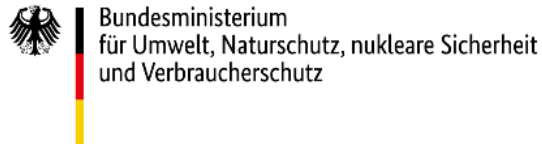
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**Das Projekt SEBAS wird gefördert im Bundesprogramm Biologische Vielfalt durch das Bundesamt für Naturschutz mit Mitteln des Bundesministeriums für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz. Diese Präsentation gibt die Auffassung und Meinung des Zuwendungsempfängers des Bundesprogramms Biologische Vielfalt wieder und muss nicht mit der Auffassung des Zuwendungsgebers über einstimmen.**

Gefördert durch:



aufgrund eines Beschlusses  
des Deutschen Bundestages



# Literature



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Mitarbeiter!

Mitglied  
werden!

Spenden!

Thank you!

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